Unit III
Threat/Hazard Assessment

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Unit Objectives

Identify the threats and hazards that may impact a building or site.

Define each threat and hazard using the FEMA 426 methodology.

Provide a numerical rating for the threat or hazard and justify the basis for the rating.

Define the Design Basis Threat, Levels of Protection, and Layers of Defense.

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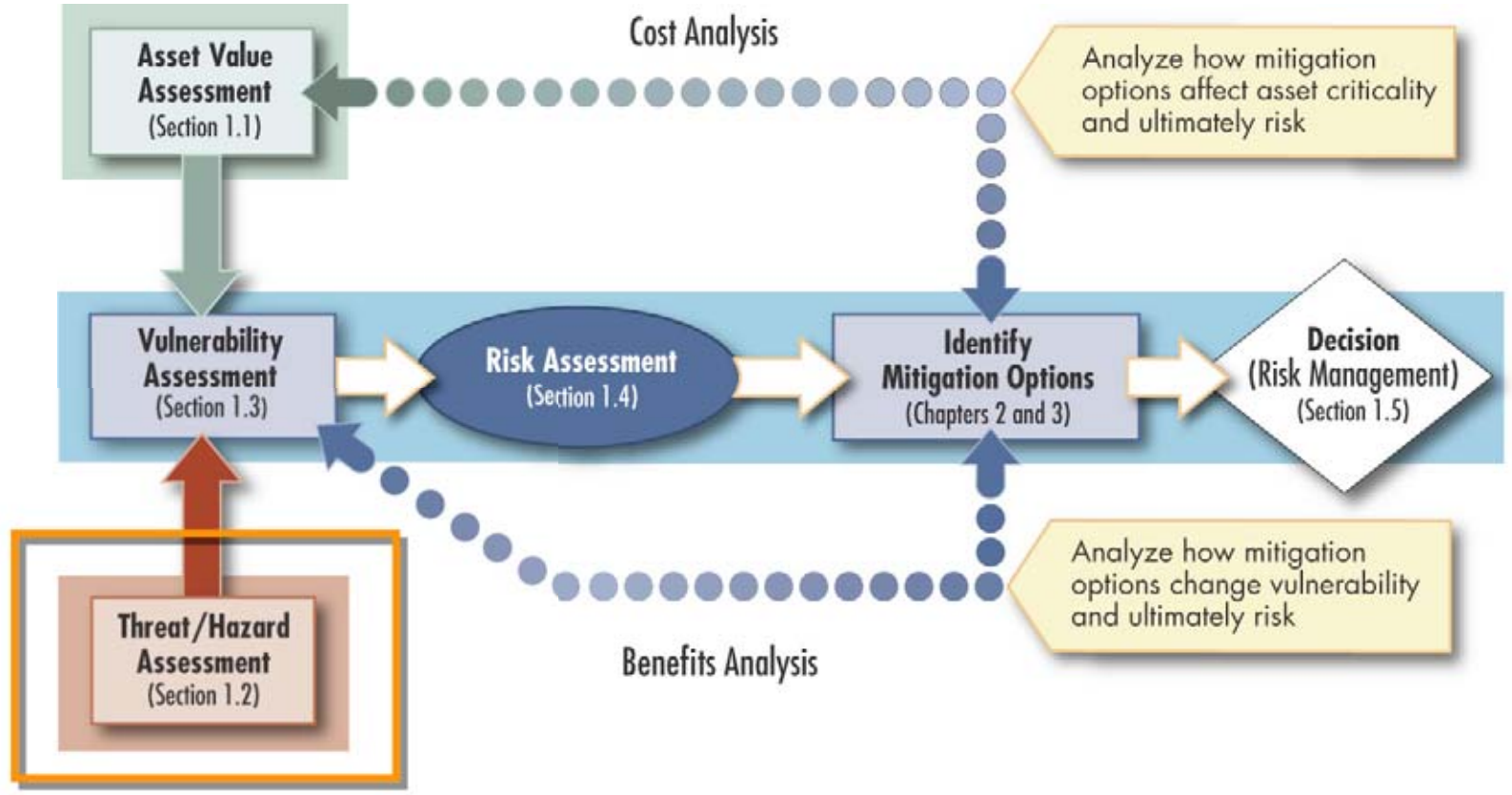
Assessment Flow Chart



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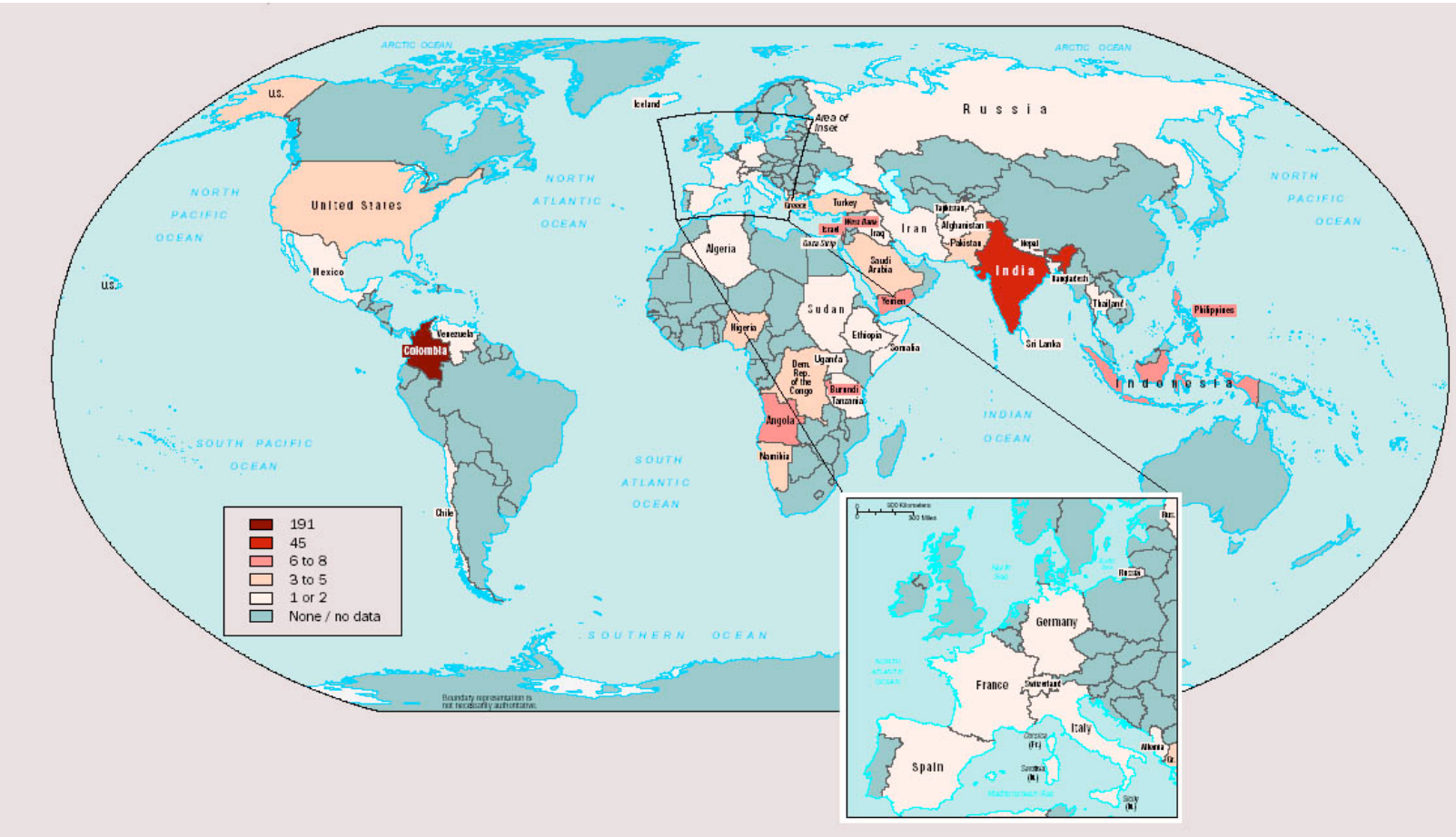
Nature of the Threat



From *Patterns of Global Terrorism – 2001* Released by the Office of the Coordinator for Counterterrorism, May 21, 2002

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Nature of the Threat

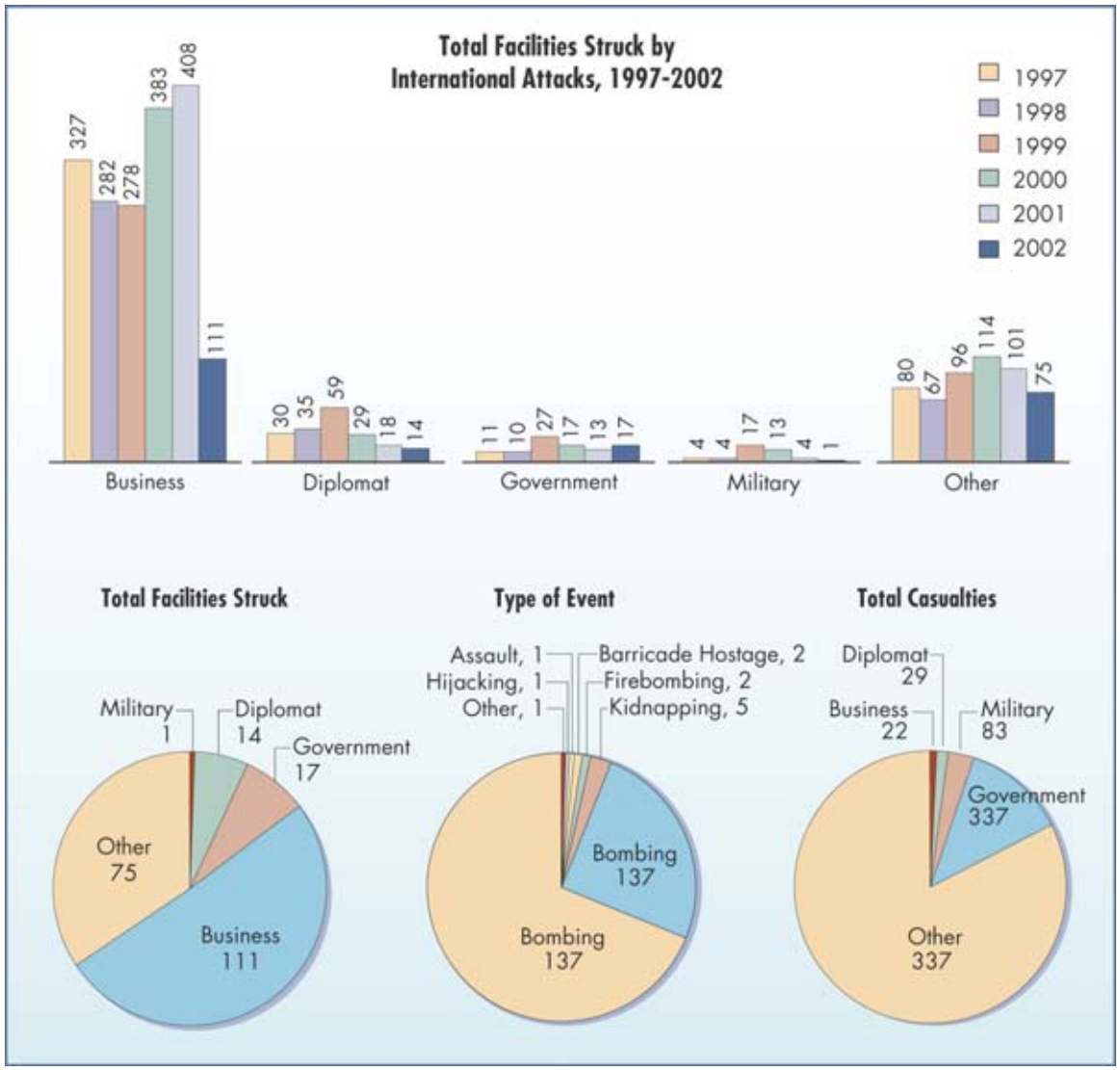

Figure 1-2: Total Facilities Struck by International Terrorist Attacks – 1997 to 2002, p. 1-3

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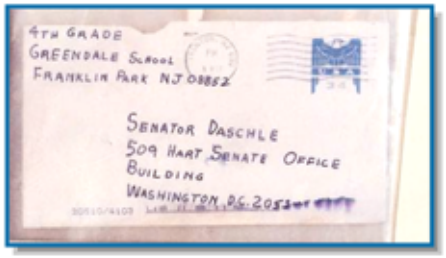
CBR Terrorist Incidents Since 1970



March 1995 Sarin
12 Dead, 5,500 Affected

May 1995 Plague

April 1997 U235

June 1994 Sarin
7 Dead, 200 Injured

February 1997 Chlorine
14 Injured, 500 Evacuated

March 1998 Cesium-137

1972 Typhoid

1984 Salmonella
200 Injured

70 75 80 85 90 95 00

1992 Cyanide

June 1996 Uranium

2001 Anthrax

1984 Botulinum

March 1995 Ricin

December 1995 Ricin

1985 Cyanide

April 1995 Sarin

November 1995 Radioactive Cesium

April-June 1995 Cyanide, Phosgene, Pepper Spray

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Hazard

Hazard - A source of potential danger or adverse condition.

- Natural Hazards are naturally-occurring events such as floods, earthquakes, tornadoes, tsunami, coastal storms, landslides, hurricanes, and wildfires.

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Manmade Threats/Hazards

Manmade Hazards – are technological accidents and terrorist attacks. These are distinct from natural hazards primarily in that they originate from human activity.

Technological accident

Terrorism act

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Identify Each Threat/Hazard

Agri-terrorism

Radiological Agent

Nuclear Device

Hazardous Materials Release

Unauthorized Entry

Surveillance

Improvised Explosive Device (Bomb)

Chemical Agent

Arson/Incendiary Attack

Biological Agent

Cyberterrorism

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Define Each Threat/Hazard

Existence

Capability

History

Intention

Targeting

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Determine Threat Level for Each Hazard

Threat Level	Threat Analysis Factors				
	Existence	Capability	History	Intentions	Targeting
Severe (Red)	●	●	●	●	●
High (Orange)	●	●	●	●	❑
Elevated (Yellow)	●	●	●	❑	
Guarded (Blue)	●	●	❑		
Low (Green)	●	❑			

● Factor must be present ❑ Factor may or may not be present

Please note the DHS does not use these threat analysis factors to determine threat level.

SOURCE: COMMONWEALTH OF KENTUCKY OFFICE OF HOMELAND SECURITY

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Table 1-4: Homeland Security Threat Conditions, page 1-24 (source Commonwealth of Kentucky Office of Homeland Security)

Threat Sources

Identify Threat Statements

Identify Area Threats

Identify Facility-Specific Threats

Identify Potential Threat Element Attributes

Seek information from local law enforcement, FBI, U.S. Department of Homeland Security, and Homeland Security Offices at the state level.

Reference: Page 1-15, FEMA 426

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Critical Functions

Function	Cyber attack	Armed attack (single gunman)	Vehicle bomb	CBR attack
Administration				
Asset Value	5	5	5	5
Threat Rating	**8**	**4**	**3**	**2**
Vulnerability Rating				
Engineering				
Asset Value	8	8	8	8
Threat Rating	**8**	**5**	**6**	**2**
Vulnerability Rating				

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Critical Infrastructure

Function	Cyber attack	Armed attack (single gunman)	Vehicle bomb	CBR attack
Site				
Asset Value	4	4	4	4
Threat Rating	**4**	**4**	**3**	**2**
Vulnerability Rating				
Structural Systems				
Asset Value	8	8	8	8
Threat Rating	**3**	**4**	**3**	**2**
Vulnerability Rating				

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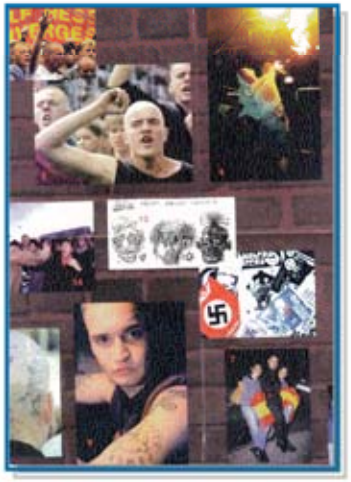
Design Basis Threat

The threat against which assets within a building must be protected and upon which the security engineering design of the building is based.



Level of Protection (1)

Layers of Defense Elements

- Deter
- Detect
- Deny
- Devalue

The strategy of Layers of Defense uses the elements and Levels of Protection to develop mitigation options to counter or defeat the tactics, weapons, and effects of an attack defined by the Design Basis Threat.

Deter: The process of making the target inaccessible or difficult to defeat with the weapon or tactic selected. It is usually accomplished at the site perimeter using highly visible electronic security systems, fencing, barriers, lighting and security personnel; and in the building by securing access with locks and electronic monitoring devices.

Detect: The process of using intelligence sharing and security services response to monitor and identify the threat before it penetrates the site perimeter or building access points.

Deny: The process of minimizing or delaying the degree of site or building infrastructure damage or loss of life or protecting assets by designing or using infrastructure and equipment designed to withstand blast and chemical, biological, or radiological effects.

Devalue: The process of making the site or building of little to no value or consequence, from the terrorists' perspective, such that an attack on the facility would not yield their desired result.

Reference: Page 1-9, FEMA 426

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Levels of Protection (2)

Level**	Typical Location	Examples of Tenant Agencies***	Security Measures (based on evaluation)
I	10 Employees (Federal) 2,500 Square Feet Low Volume Public Contact Small "Store Front" Type Operation	Local Office District Office Visitor Center USDA Office Ranger Station Commercial Facilities Industrial/Manufacturing Health Care	High Security Locks Intercom Peep Hole (Wide View) Lighting w/Emergency Backup Power Controlled Utility Access Annual Employee Security Training
II	11 - 150 Employees (Federal) 2,500 - 80,000 Square Feet Moderate Volume Public Contact Routine Operations Similar to Private Sector and/or Facility Shared with Private Sector	Public Officials Park Headquarters Regional/State Offices Commercial Facilities Industrial Manufacturing Health Care	Entry Control Package w/Closed Circuit Television (CCTV) Visitor Control/Screening Shipping/Receiving Procedures Guard/Patrol Assessment Intrusion Detection w/Central Monitoring CCTV Surveillance (Pan-Tilt, Zoom System) Duress Alarm w/Central Monitoring
III	151 - 450 Employees (Federal) Multi-Story Facility 80,000 - 150,000 Square Feet Moderate/High Volume Public Contact Agency Mix: Law Enforcement Operations Court Functions Government Records	Inspectors General Criminal Investigations Regional/State Offices GSA Field Office Local Schools Commercial Facilities Industrial Manufacturing Health Care	Guard Patrol on Site Visitor Control/Screening Shipping/Receiving Procedures Intrusion Detection w/Central Monitoring CCTV Surveillance (Pan-Tilt/Zoom System) Duress Alarm w/Central Monitoring
IV	>450 Employees (Federal) Multi-Story Facility >150,000 Square Feet High Volume Public Contact High-Risk Law Enforcement/Intelligence Agencies District Court	Significant Buildings and Some Headquarters Federal Law Enforcement Agencies Local Schools, Universities Commercial Facilities Health Care	Extend Perimeter (Concrete/Steel Barriers) 24-Hour Guard Patrol Adjacent Parking Control Backup Power System Hardened Parking Barriers
V	Level IV Profile and Agency/Mission Critical to National Security	Principal Department Headquarters	Agency-Specific

Table 1-6, page 1-26, FEMA 426

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Levels of Protection (3)

DoD Minimum Antiterrorism (AT) Standards for New Buildings

Level of Protection	Potential Structural Damage	Potential Door and Glazing Hazards	Potential Injury
Below AT standards	Severely damaged. Frame collapse/ massive destruction. Little left standing.	Doors and windows fail and result in lethal hazards	Majority of personnel suffer fatalities.
Very Low	Heavily damaged - onset of structural collapse. Major deformation of primary and secondary structural members, but progressive collapse is unlikely. Collapse of non-structural elements.	Glazing will break and is likely to be propelled into the building, resulting in serious glazing fragment injuries, but fragments will be reduced. Doors may be propelled into rooms, presenting serious hazards.	Majority of personnel suffer serious injuries. There are likely to be a limited number (10 percent to 25 percent) of fatalities.
Low	Damaged – unrepairable. Major deformation of non-structural elements and secondary structural members, and minor deformation of primary structural members, but progressive collapse is unlikely.	Glazing will break, but fall within 1 meter of the wall or otherwise not present a significant fragment hazard. Doors may fail, but they will rebound out of their frames, presenting minimal hazards.	Majority of personnel suffer significant injuries. There may be a few (<10 percent) fatalities.
Medium	Damaged – repairable. Minor deformations of non-structural elements and secondary structural members and no permanent deformation in primary structural members.	Glazing will break, but will remain in the window frame. Doors will stay in frames, but will not be reusable.	Some minor injuries, but fatalities are unlikely.
High	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Glazing will not break. Doors will be reusable.	Only superficial injuries are likely.

Table 4-1, page 4-9

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Level of Protection (4)

UFC 4-010-01 APPENDIX B DoD MINIMUM ANTITERRORISM STANDARDS FOR NEW AND EXISTING BUILDINGS	
Standard 1	Minimum Stand-off Distances
Standard 2	Unobstructed Space
Standard 3	Drive-Up/Drop-Off Areas
Standard 4	Access Roads
Standard 5	Parking Beneath Buildings or on Rooftops
Standard 6	Progressive Collapse Avoidance
Standard 7	Structural Isolation
Standard 8	Building Overhangs
Standard 9	Exterior Masonry Walls
Standard 10	Windows, Skylights, and Glazed Doors
Standard 11	Building Entrance Layout
Standard 12	Exterior Doors

Level of Protection (5)

UFC 4-010-01 APPENDIX B DoD MINIMUM ANTITERRORISM STANDARDS FOR NEW AND EXISTING BUILDINGS	
Standard 13	Mailrooms
Standard 14	Roof Access
Standard 15	Overhead Mounted Architectural Features
Standard 16	Air Intakes
Standard 17	Mailroom Ventilation
Standard 18	Emergency Air Distribution Shutoff
Standard 19	Utility Distribution and Installation
Standard 20	Equipment Bracing
Standard 21	Under Building Access
Standard 22	Mass Notification

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Summary

Process

- Identify each threat/hazard
- Define each threat/hazard
- Determine threat level for each threat/hazard

Threat Assessment Specialist Tasks

Critical Infrastructure and Critical Function Matrix

Determine the “Design Basis Threat”

Select the “Level of Protection”

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Unit III Case Study Activity

Asset Value Ratings

Background

Hazards categories: natural and manmade

HIC case study threat: explosive blast and chemical, biological, and/or radiological agents

Result of assessment: “Threat Rating,” a subjective judgment of a threat

Requirements

Refer to HIC case study data and GIS portfolio

Complete worksheet tables:

- HIC Critical Functions Threat Rating
- HIC Infrastructure Threat Rating

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